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CONTINUED ELECTROMAGNETIC PROTECTION
INTEGRITY OF AIRCRAFT AND SYSTEMS - PHASE II
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POLLUTANT AND WICKING TESTS ON SHIELD EFFECTIVENESS

Task Two of ìContinued Electromagnetic Protection Integrity of Aircraft & Systems Phase-IIî research is being conducted to study the degrading effects on the electrical characteristics of the shielding caused by pollutants and wicking of the pollutants on the wiring harnesses. Test panels were designed to specifications and subjected to various severity levels of their specified environmental pollutant. Figure 1 is an example of a panel used in this study. Pollutants used in this testing include JP-4, hydraulic fluid, deicing fluid, dirt and oil. Shield effectiveness is measured by two means: loop impedance measurements and current transfer from shield to inner conductors. Loop impedance is measured using different measurement devices: a loop impedance meter; a network analyzer; and a DC milliohmmeter.

A network analyzer is used to record the electrical characteristics of a wire bundle harness over selected range of frequencies (10Hz ñ 10MHz). It measures the magnitude of the loop impedance of the shield resistance and the shield inductance of the cable. The data is collected at the beginning and at the end of each degradation test. A loop impedance meter is used to provide a loop impedance measurement at a set frequency, 1KHz for the British Aerospace loop impedance meter. The data is collected at each severity level to see the effects of individual or combination degradation tests. The DC milliohmmeter is used to provide a DC resistive measurement, between any two points, from 1mΩ to 2Ω.

Results of this testing will be available during the October 2002 AACE annual meeting.

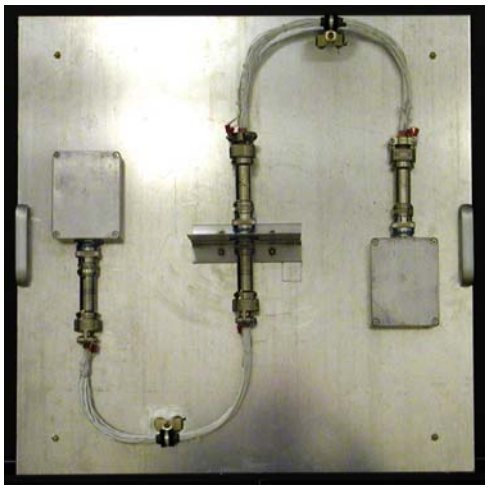

FIGURE 1. SAMPLE PANEL USED FOR POLLUTANT AND WICKING TESTING